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CONTENT MANAGEMENT SYSTEMS (CMS)

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ABSTRACT

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ABSTRACT:

This thesis describes the three most common and widely used content management systems (CMS) used to power several millions of business websites on the internet. Since there are many other content managements systems online, this report provides some helpful guides on each of these three most used systems and the web design projects that each of them maybe most suitable.

There are plenty of options when it comes to selecting a content management system for a development project and this thesis focuses on making a detailed comparison between the three most commonly used ones. This comparison will help provide a clear understanding of why a content management system maybe preferred to the other when considering any web design project.
To help detect the content management system (CMS) or development platform that an already existing website is built on, some helpful website analyzing tools are also discussed in this report.

By reading this report, a reader with no previous experience with content management systems will be able to have a general view on what they are, what the commonly used ones are and what to consider when making a choice of content management system to use. Also a reader with some previous experience with these systems will be able to know the content management systems that are suitable for his/her business or professional goals.

Keywords:

Content Management Systems, CMS, WordPress, Joomla, Drupal, PHP, MYSQL

CONTENTS

ABBREVIATIONS

Terms	Definition
CCK	Content Construction kit
CMS	Content Management Systems
CMA	Content Management Application
CDA	Content Delivery Application
FTP	File Transfer Protocol
GPL	GNU General Public License
HTML	Hypertext Markup Language
iOS	An operating system used for mobile devices manufactured by Apple Inc.
Nginx	A web server and reverse proxy server.
OOP	Object Oriented Programming
PDF	Portable Document Format
suPHP	A tool for executing PHP scripts with the permissions of their owners
WYSIWYG	What You See Is What You Get
XAMPP	an open source cross-platform web server solution stack package
XML	Extensible Markup Language

1 INTRODUCTION

Content management systems have now gradually become one of the major backbones behind several millions of business or professional websites on the internet. Content Management systems are computer applications that allow publishing, editing and modifying content, organizing, deleting as well as maintenance from a central interface. They are often used to run websites containing blogs, news, and shopping. This makes the management of the contents of a website quite easy and convenient without having to manually go through the hand coding huddle. Content management systems have been available since the late 1990s.

Considering the basic concept of user and content, a content management system (CMS) is made up of two main elements - the content management application (CMA) and the content delivery application (CDA). The content management application element refers to the front-end user interface which allows a user, who may not necessarily have a technical knowledge, to add, modify and delete content from a webpage without the assistance of a webmaster. While the content delivery application element uses and compiles that information to update the website.

There are plenty of options when it comes to picking a content management system for a development project and this thesis focuses on only the most commonly used ones. Discussing these most commonly used content management systems in this report, gives a general view of what these systems are and how they can be engaged to achieve a given web design goal. The three most used content management systems are: WordPress, Joomla and Drupal (W3Techs 2014). Each of these three systems is discussed in the later chapters of this report.

This research in the report is conducted on behalf of *InfoStrides Oy*, one of such company that is very interested in the outcome of the above described content management systems. This paper represents a small subset of the research

conducted considering the frontend usability to the backend usability, from the technical point of view to that of security which is very crucial in today's internet world. This report is also documented in such a way that a reader with little or no prior experience with any of these content management systems may still be able to grasp the basic idea of the discussed subject.

1.1 Research Method

Digital materials (web resources) have been employed as the preferential method of information sourcing for this report as there are quite a number of highly respected authority web resources with a proven track record in this field of content management systems. Since these the topic of this thesis is web based related, it became very important to employ relevant web resources in this report.

In addition to the above discussed method of information sourcing, necessary emails and meetings with the thesis teacher and the company's research supervisor have proven to be instrumental in directing the research process. The informal nature of these meetings created a targeted free flow of ideas and as such deepened the understanding of the thesis subject discussed.

1.2 Research Objective

The objective of this report is to document a detailed analysis on the three most used content management systems (CMS) used by several millions of business websites on the internet. It also discusses the difference between these systems and why one content management system maybe preferred to the other when considering a given web design project. The result of this comparison provides the basics that can be used by both the entrepreneurs and the IT professionals to acquaint themselves on the content management system that may be best suitable for their business or professional goals.

2 WORDPRESS

WordPress is most used content management systems (CMS) on the internet today. It is based on *PHP* and *MYSQL* technologies and licensed under the second version of the General Public License (*GPLv2)* or later versions. WordPress is an open source blogging tools which means that it is free to use without necessarily paying anyone a license fee. This has made WordPress the largest self-hosted blogging tool in the world (WordPress 2014).

In May 27, 2003, WordPress was started to enhance the typography of everyday writing by its founders *Matt Mullenweg* and *Mike Little* (Mullenweg 2003). It is an open source project because there are hundreds of people around the world that is working on it. It was founded out a desire to create an elegant and well-architecture personal publishing system (see figure 1).

FIGURE 1. WordPress

The initial release of WordPress called *New Point Seven Beta* was introduced in 2003 (Mullenweg 2003). Between the initial release and the latest, other updated releases have existed. The latest (stable) WordPress 4.0 release called *Benny* was introduced in September 4, 2014 (Releases Category Archive 2014). "WordPress has had over 65 million downloads since version 3.0 was released..." (Mullenweg 2011).

Plugins with version 1.2 were introduced into WordPress platform in 2004 while the theme system and the static pages with version 1.5 were introduced in 2005 (WordPress Codex 2014). Web hosting and WordPress installation process are two important factors to consider when using WordPress.

2.1 WordPress Web Hosting

Web hosting is one of the vital components of every successful website and there are several thousands of web hosting services on the internet. Majority of these web services meet the WordPress minimum requirements and choosing the right one can be quite challenging. This is because WordPress works best when it is in a good hosting environment (WordPress 2014.)

The minimum requirements to run WordPress on any host are: *PHP* version 5.2.4 or higher and *MyQSL* version 5.0 or higher. *Apache* or *Nginx* is recommended because they are the most robust and rich server for running WordPress. Recommended (but not required) for better security hosting is to run WordPress using an account's username instead of the server's default shared username. The most common way nowadays for hosting companies to do this is by using *suPHP,* which is a good tool for executing PHP scripts with the permissions of their owners (WordPress 2014).

2.2 WordPress Installation

After selecting a desired web hosting company as described above (see 1.1), WordPress installation process is another important factor to consider. Most of the time, the installation process of WordPress is quite simple and it take couple of minutes to complete the installation. WordPress installation could be either automatic or manual.

The automatic installation is most common because many web hosting company on the internet now offer tools that automatically does the installation with clicks of the button (WordPress 2014). The manual installation is used in self-hosted servers which involves manually downloading the latest release of WordPress on local computer and uploading it to the server via a shell or FTP client.

To illustrate the automatic installation (one-click installs) of WordPress, *DreamHost* (www.dreamhost.com) one of the hosting companies is used. This illustration or example shows how quick *WordPress* can be installed from a user's hosting account. When logged into the administration page of the account, the user is presented with most of the options that are available in the dashboard (see figure 2) of the page.

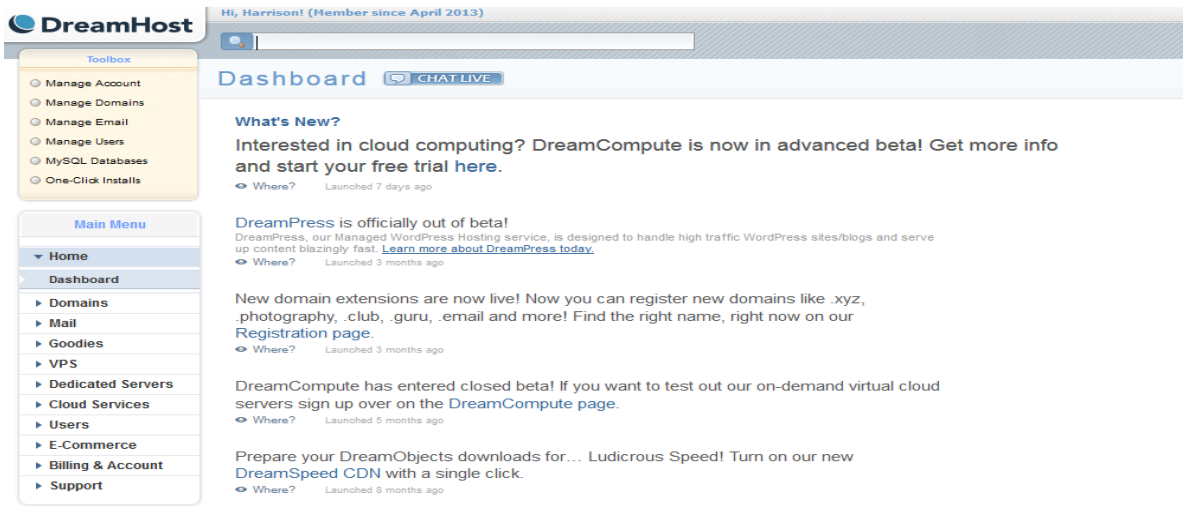

FIGURE 2. DreamHost Dashboard

At the left side of the dashboard (see figure 2) are options for managing the hosted domains (websites). To install WordPress, the "*One-Click Installs*" is selected (see figure 3).

FIGURE 3. On-Click Installs

When the "*One-Click Installs*" is selected, a page that shows all the lists of available applications, of which *WordPress* is among, is displayed. Then the user is expected to click on "*WordPress*" from the list to get the automatic installation process started (see figure 4).

FIGURE 4. WordPress Installation

After WordPress is selected as shown (see figure 4), then the option to select the domain name to install it is provided from the drop-down menu of the pop-up page. Finally, the *"Install it for me now"* button is click to complete the installation (see figure 5).

FIGURE 5. One-Click Installer

It is also important to know that in automatic installation process for WordPress demonstrated with the above hosting company (DreamHost) is similar with other hosting companies that also provide this same option of installation. Most of them also provide a simple-to-follow installation guide on their official websites. So following the installation guides provided by the hosting company that a user has chosen is vital.

2.2.1 Themes

WordPress themes have both free and paid versions. The free versions are quite many and commonly used server thousands of blogs on the internet. The Paid versions are more flexible in designs and it often comes with technical supports by the theme developers. WordPress users may install and switch between themes. Users can change the look and functionality of a WordPress website without necessarily altering the site's content or structure. So it is one's web design goal that determines one's choice of theme.

For example, after WordPress is installed on a domain (see figures 2, 3, 4 and 5), a user can then access the WordPress administration page (backend) of his website with his login details created during the installation process. Assuming the user has logged with his login details, a backend page with all the available options in the dashboard is displayed (see figure 6).

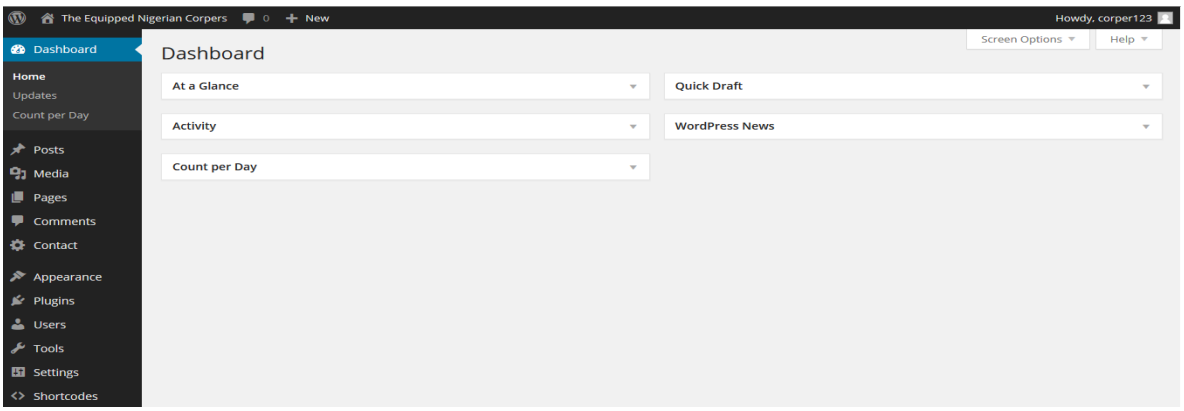

FIGURE 6. WordPress Dashboard

To replace the default theme with a new one from the WordPress administration page, the mouse is hovered on the "*Appearance*" option and the "*Theme*" option is selected from the displayed drop-down list (see figure 7).

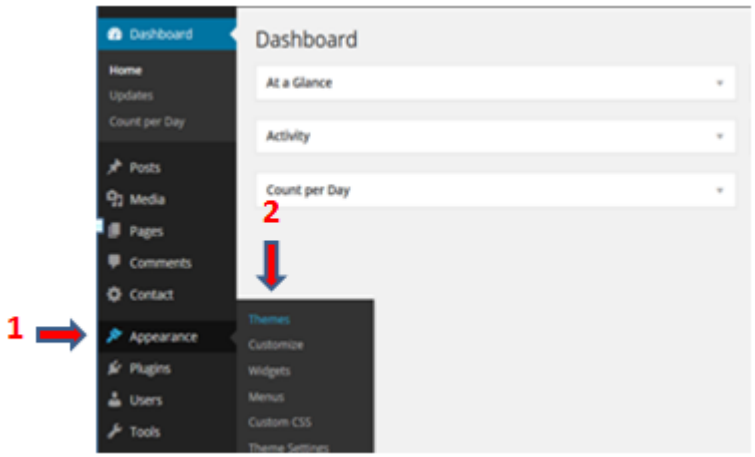

FIGURE 7. Appearance Option

From the displayed "Themes" page, the "*Add New"* button is clicked (see figure 8) and the "Add Themes" page is displayed.

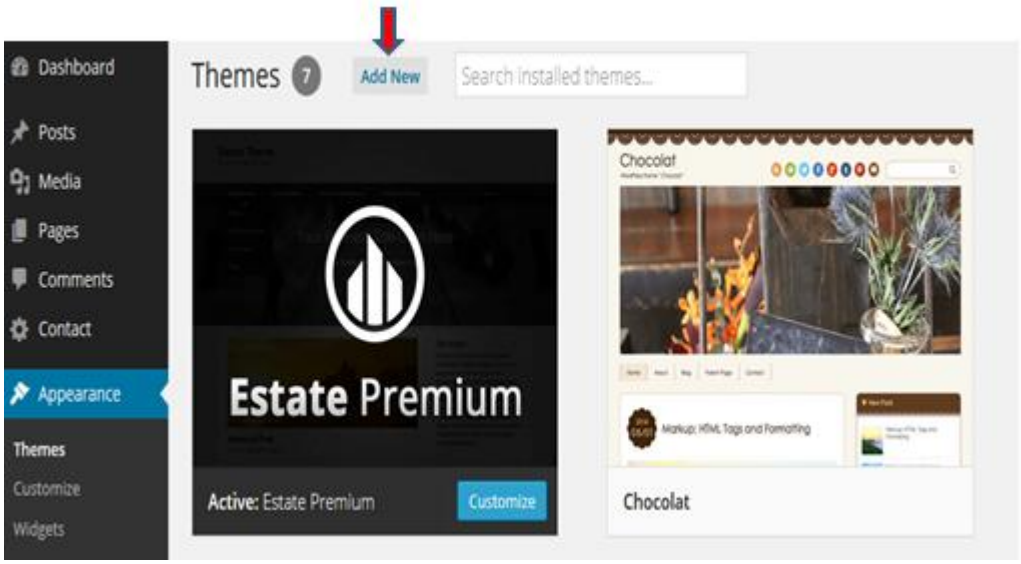

FIGURE 8. Theme Lists

In the displayed "Add Themes" page, different categories of themes are listed. Themes can also be searched by keywords using the search options on the top-right side of the page (see figure 9).

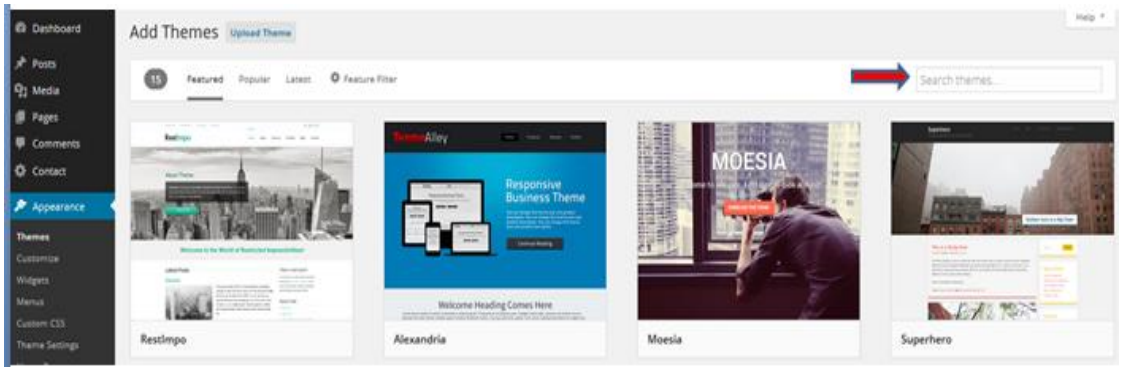

FIGURE 9. Theme Search Option

To install a new theme from the displayed themes lists, the selected theme is hovered with the mouse and the "*Install*" button is clicked. To get more details about the selected theme before installation, the "*Details & Preview*" button is clicked (see figure 10). The "*Upload Theme*" button on the top of the page is used for external theme uploads.

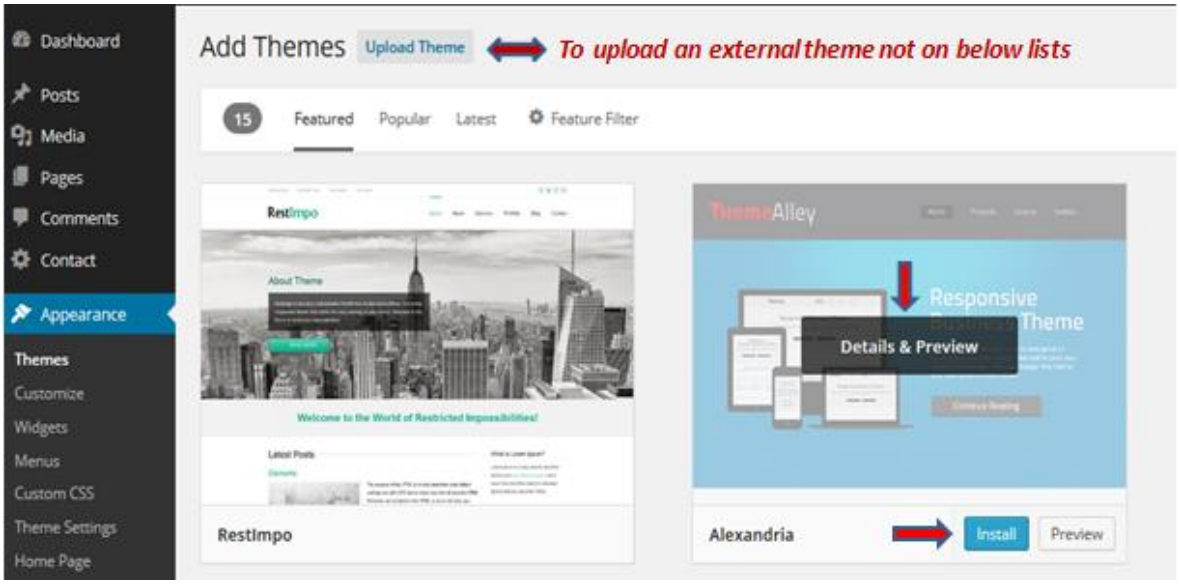

FIGURE 10. Theme External Upload Option

2.2.2 Plugins

While the theme determines how a WordPress website is presented, the plugin can extend the functionality of that website. WordPress has a database over *33,600* plugins and over *749,010,790* plugin downloads (WordPress Plugin Directory 2014). Each of these plugins comes with a custom functionalities and features which enables its users to tailor their websites to their specific needs.

These custom functionalities range from client portals which is used to display private information to logged in users, to content displaying features such as the additional navigational bars and widgets. Amongst these thousands of featured plugins in WordPress' database, there are some that can be used to test a theme for all the latest WordPress standards and practices.

For example, the process of installing plugins on a WordPress website is almost similar to that of the theme discussed above (see figure 6). To install a new plugin from the WordPress dashboard, the "*Plugins*" option is hovered with the mouse and the "*Add New*" option is clicked from the drop-down lists (see figure 11). To see the lists of the already installed plugins, the "*Installed Plugins*" option is selected.

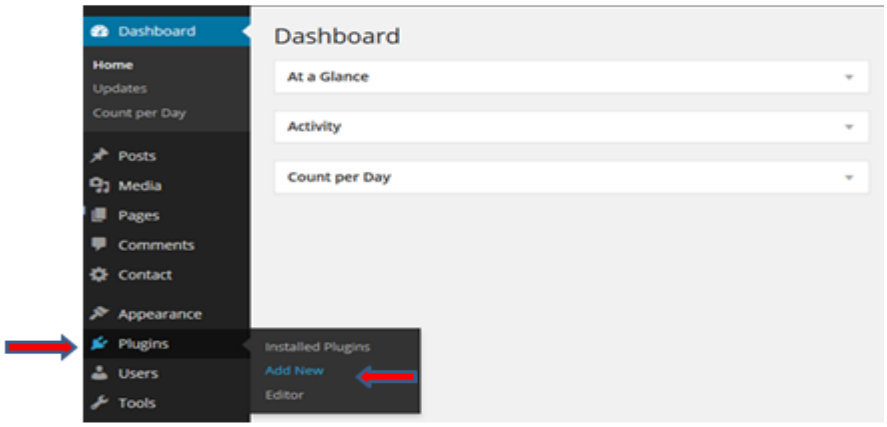

FIGURE 11. Plugin Installation

On the displayed "*Add Plugins*" page, various categories of plugins are listed for users to select their desired plugins. There is also a possibility of searching for related plugins by using the search box at the top-right of the page. To get more details about a plugin before installation, the "*More Details*" option is clicked while the "*Install Now*" button is clicked to install a desired plugin (see figure 12).

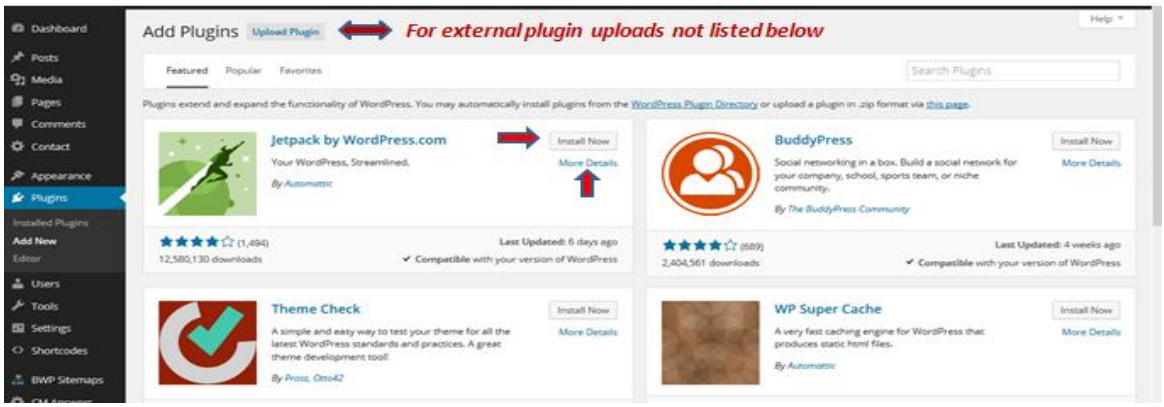

FIGURE 12. External Plugin Installation

2.3 WordPress Mobile

Apart from publishing posts from a desktop computers to any WordPress site, it is also possible to make posts from mobile devices via WordPress mobile application. WordPress is available on the three major mobile operating systems: *iOS, Android* and *BlackBerry*. Users can easily access their WordPress sites from their mobile devices. Most WordPress themes are fully

responsive, which also means that they can be easily viewed or accessed from web enabled mobile devices.

With WordPress for iOS, users can write posts, upload photos, edit pages, and manage comments on your blog from your *iPhone*, *iPad*, or *iPod touch*. WordPress for Android lets users to write new posts for their WordPress blog edit content, and manage comments with built-in notifications, all on your Android device. Like the *iOS* and *Android* above, the WordPress for *BlackBerry* is a native app that enables users to posts to their blog, Manage comments and media upload videos from their BlackBerry devices (WordPress Mobile Apps 2014).

3 JOOMLA

Joomla, which started on the 17 August 2005, is one of the most popular free and open-source content management systems (CMS) for web content publishing. It is built on a model-view-controller (MVC) web application framework and also uses the object-oriented programming (OOP) techniques for its application. With over 50million downloads as of February 2014, Joomla also has over 7,700 free and commercial extensions available (Joomla 2014) Joomla is the second most used content management system on the internet (see figure 13).

FIGURE 13. Joomla

Joomla is created to provide a flexible platform for digital publishing and collaboration (Joomla! 2014). It is used to power websites of all shapes and sizes. It can be used to design corporate websites or portals, corporate intranets and extranets, online magazines, newspapers, publications, E-commerce websites, small business websites, Government applications, community based portals, school and church websites, personal or family homepages (Joomla! Docs 2014).The only limitation to what kind of website design that one can do with Joomla is one's imagination and creativity.

"Joomla is the software that brings together the content and modules using the template to produce Webpages dynamically. No more HTML pages to store, update, link together and then upload to your server" (Joomla! Docs 2014).The initial release of Joomla was introduced in August 17, 2005. Other updated releases have existed between the initial release and the latest release (Joomla! 3.3.6) which was introduced on October 1, 2014 (Joomla! 3.3.6 Released 2014).

3.1 Joomla Hosting & Installation

To have a Joomla website like other websites on the internet, a web hosting account is required. There is also the possibility of testing or experimenting with a working installation of Joomla from their official demo website address (www.demo.joomla.org). This demo site is hosted for free for 90 days on the web servers of their official demo hosting partner, *SiteGround* (Demo.Joomla! 2014).

If a user have already created a web hosting account from one of the hosting companies that meet Joomla's recommended hosting requirements (see figure 14)**,** one is able to automatically install Joomla from the administration backend of that hosting company. These automatic installations provided by these hosting companies are called One Click Install. This method offers a quick and easy instant installation of Joomla by simply following the installation guide provided by the hosting company (Joomla! Docs 2014).

Therefore, before installing Joomla, there are some requirements that need to be met in order to install Joomla 3.x successfully. The same is required for a dedicated server, a shared hosting plan server, or when installing a copy on a local computer for testing or development (Joomla! Docs 2014).

Joomla 3.x 3.x

Software	Recommended	Minimum
PHP (Magic Quotes GPC off)	5.4 +	5.3.10 +
Supported Databases:		
MySQL[1] (InnoDB support required)	5.1 +	5.1 +
MSSQL	10.50.1600.1 +	10.50.1600.1 +
PostgreSQL	8.3.18 +	8.3.18 +
Supported Web Servers:		
Apache(with mod_mysql, mod_xml, and mod_zlib)[2][3]	2.x+	2.x+
Hiawatha (with UrlToolkit support)	latest	8.0
Nginx	1.1	1.0
Microsoft IIS	7	7

FIGURE 14. Technical Requirements

It is also possible to use the conventional method to install Joomla on a web server. This requires one to copy the Joomla zip file to one's hosting account, unzip, create a database and then run the installation. Without a site appearing on the internet, it is possible to have Joomla installed on a local computer. This can be done by using a package called *XAMPP*. The aim of this is for testing of a site before it is uploaded to a web server on the internet.

The automatic installation (One-click installs) of Joomla for example, is similar with that of the WordPress earlier illustrated (see figure 2 & figure 3). The difference is that *Joomla* selected instead of *WordPress* (see figure 15).

FIGURE 15. *Joomla Installation*

After *Joomla* is selected, a pop-up page is displayed with the option to select the domain name to install it. Then to complete the installation, the "Install it for me now" button is clicked (see figure 16).

FIGURE 16. *One-Click Installer*

3.2 Joomla Extensions

Just like the name suggests, Joomla extensions are software packages that extend the functionality of a Joomla website. Some extensions adds custom functions that can be selected from menus to a Joomla site, defines an additional language of a Joomla site, provides the functions that can be used by other extensions, show nonessential data in a side box, modifies content in articles while others define the look and feel of the site(Joomla! Documentation 2014).

For example, after Joomla is installed on a domain and the login credentials of the website (domain) are created by the user, he can login into the administrative page to see all the available options in the dashboard (see figure 17).

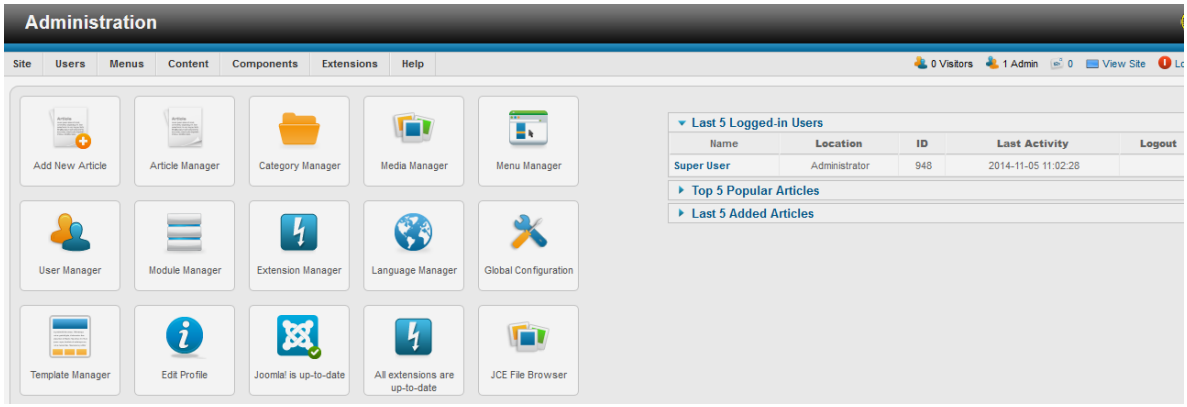

FIGURE 17. Joomla Dashboard

When designing a website with Joomla, there may be need to add some extra features or functionalities which may not available in Joomla by default. The choice of the extension used in a website depends on the kind of functionality desired. Most of the extensions are not readily available on the administration page like WordPress' but they are readily available from Joomla extension website (www.extensions.joomla.org). To install an extension from Joomla dashboard, the "*Extensions Manager*" option is selected (see figure 18). The installation process of extensions (components, plugins, templates, modules and languages) are similar most times.

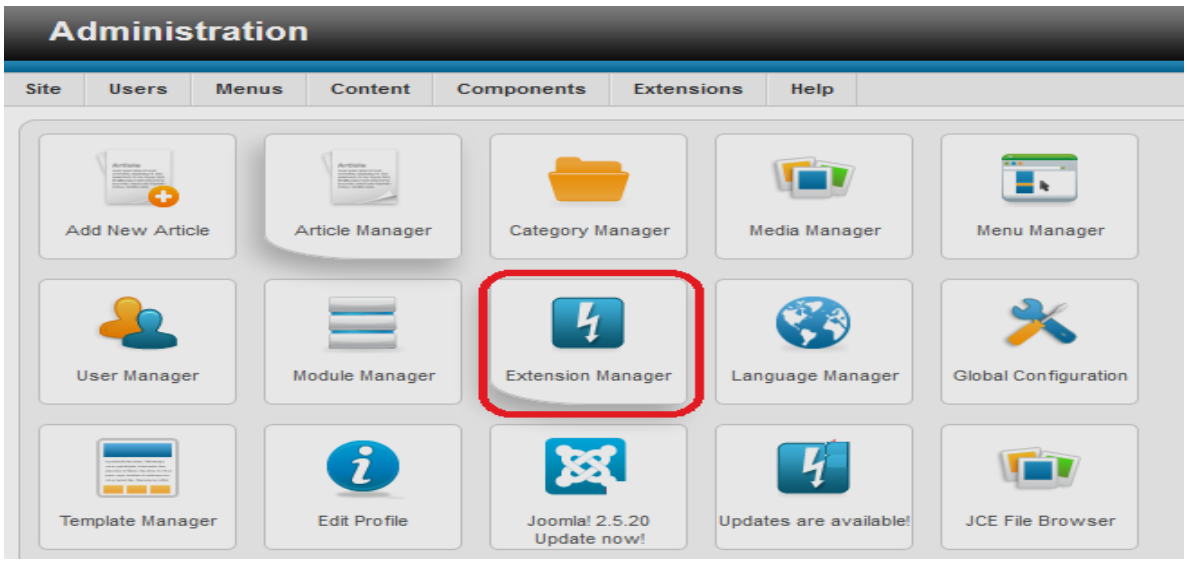

FIGURE 19. Extension Manager

3.2.1 Components

The largest and the most complex extensions of all the types of Joomla extension is the components. They are like mini-application and most of them have two main parts: a site part, which users can use to view the front end of a site and the administrator part, which is used for content editing by the site administrator.

A component is called to render the main body every time a Joomla page loads. Components are the main portion of a Joomla website because they are driven by a menu item and every menu item runs a component. For example, to install a Joomla component from the administration page, the "*Extensions Manager*" option is clicked as previously explained (see figure 19). Then a page with the options to upload and install the selected component from a local drive or a web source is displayed (see figure 20).

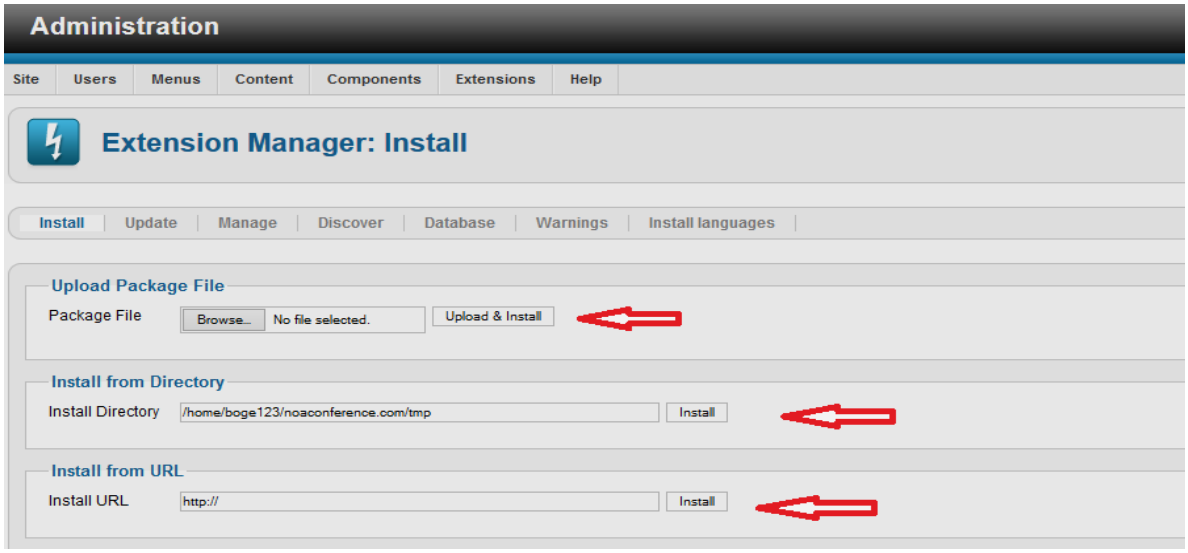

FIGURE 20. Extension Manager Installation

3.2.2 Plugins

More advanced extensions and also event handlers in essence are plugins (see figure 4 above). In the execution of any part of Joomla, an event can be triggered be it the core, a module or a component. Whenever an event is triggered, it is the plugins that are registered with the application to handle that event execute. "For example, a plugin could be used to intercept user-submitted articles and filter out bad words" (Joomla! Docs 2014).

When a particular event occurs, all the plugin functions of the types associated with that event are executed in sequence. With this, the functionality of the Joomla! Platform is powerfully extended. "It also offers extension developers a way to allow other extensions to respond to their actions, making extensions extensible" (Joomla! Docs 2014).

The installation process of plugins is the same as that of the components earlier discussed (see figure 18). To manage the lists of plugins already installed, the "*Extensions*" tab is hovered with a mouse and the "*Plug-in Manager*" is selected from the displayed drop-down list (see figure 21 & figure 22).

FIGURE 21. Extensions

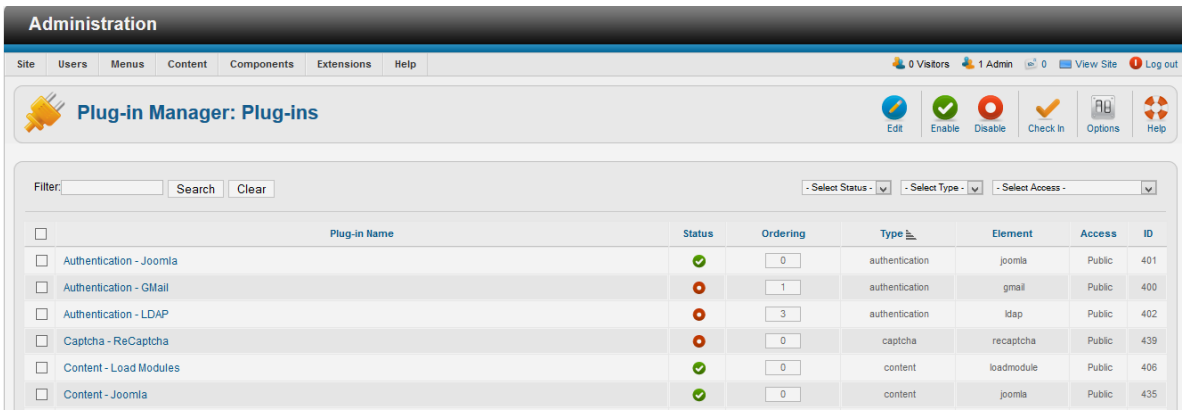

FIGURE 22. Plug-in Manager

3.2.3 Template

A template is basically the design of any Joomla powered website.Whenever the look and feel of a Joomla website is be changed by a web designer, it is the template that is used to achieve that goal. In templates, there are certain fields in which a component and as many modules as possible can be displayed. The building or customization of a Joomla template is quite simple and they provide maximum flexibility on how the site is styled (Joomla! Docs 2014).

The front-end templates and the Back-end templates are the two types of templates used by the Joomla content management system. The front-end template is responsible for controlling the way a website is presented the user

viewing the contents of the website. The back-end template is where the website administrator controls the way the administrative tasks are presented for controlling the management functions of the website (Joomla! Documentation 2014).For example, to manage the template(s) used in a Joomla site, the “Template Manager” options on the administration page is clicked with the mouse (see figure 23).

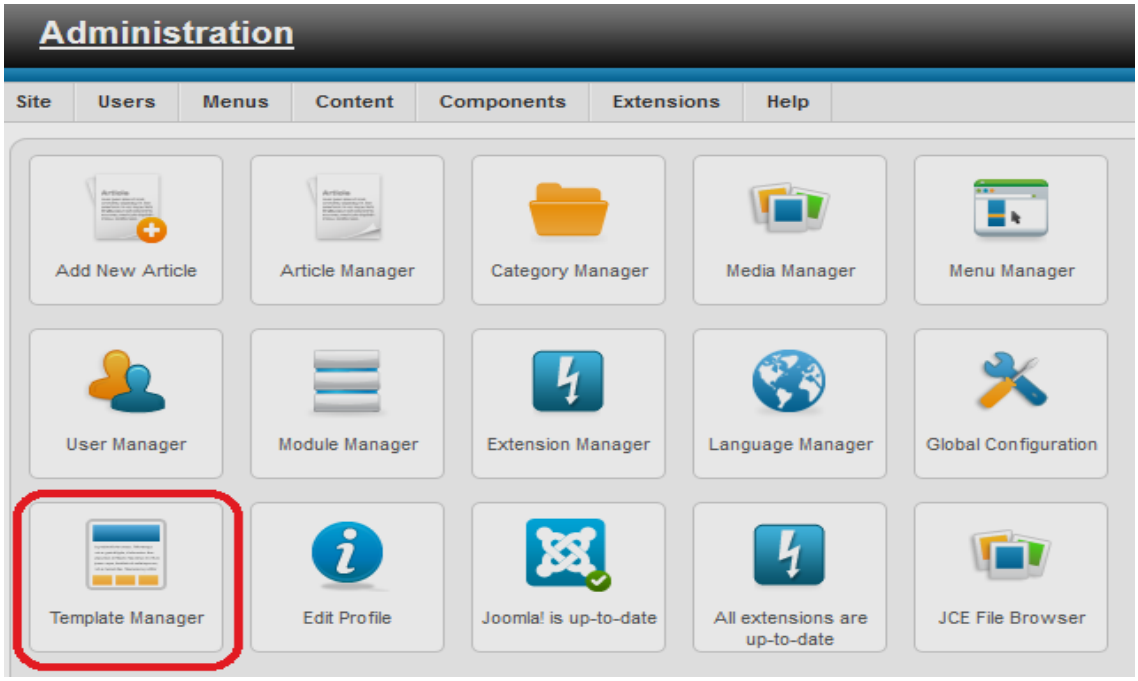

FIGURE 23. Template Manager

3.2.4 Modules

Modules are more flexible and lightweight extensions used for rendering a website page. They are often known as the *boxes* that are arranged around a component. Because modules are assigned per menu item, it is possible to show or hide any module depending on the menu item that the user is viewing. It is also important to note that modules do not necessarily need to be linked to components or anything. They can just be static HTML or text (Joomla! Docs 2014).

The most common example of a module is the login module. A placeholder in a template represents the position of the module. "Placeholders identify one or several positions within the template and tell the *Joomla!* Application where to place output from modules assigned to a particular position" (Joomla! Documentation 2014).To manage the modules on a Joomla site for example, the “Module Manager” is selected from the displayed options on the dashboard (see figure 24).

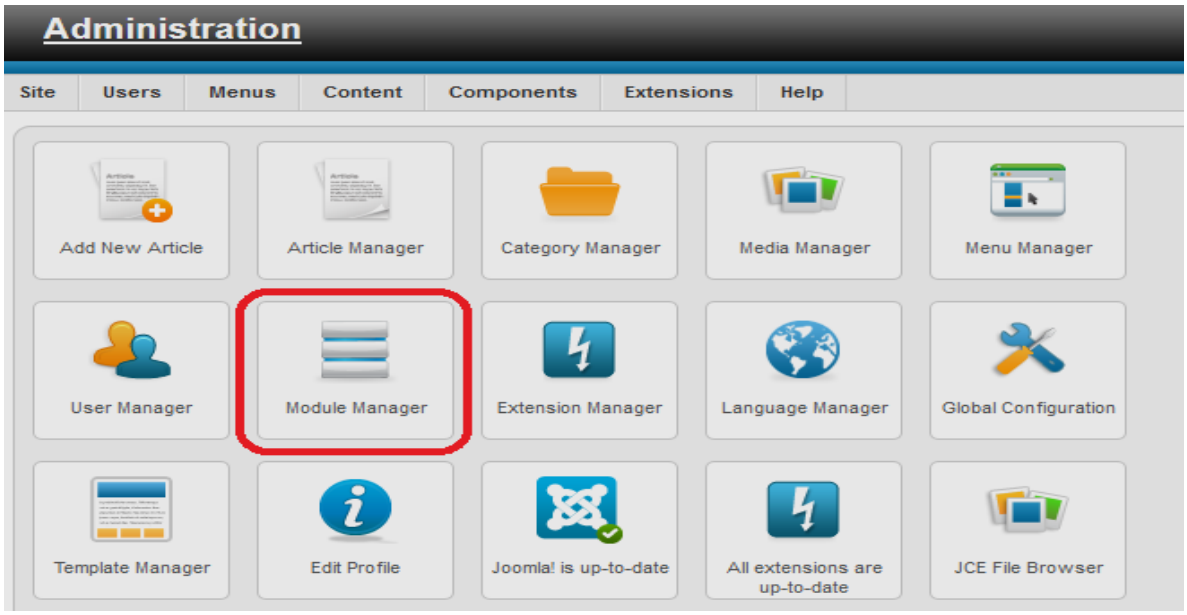

FIGURE 24. *Module Manager*

3.2.5 Languages

Language extensions are the most basic type of extensions. They can be packaged either as a core package or as an extension package. It is important to note that the language packs also include an *XML Meta file* which describes the language and font information that is use for generating PDF contents (Joomla! Docs 2014).

The language packs are divided into two main types, one for the site and the other for the administrator. "Joomla! 1.5 and higher supports a full translatable site and administrator interface" (Joomla! Documentation 2014). For example,

to manage the language(s) installed on a Joomla site, the "*Language Manager*" is selected from the displayed options (see figure 25). To install a new language pack, the "*Install Language*" menu is selected from the displayed language manager page (see figure 26).

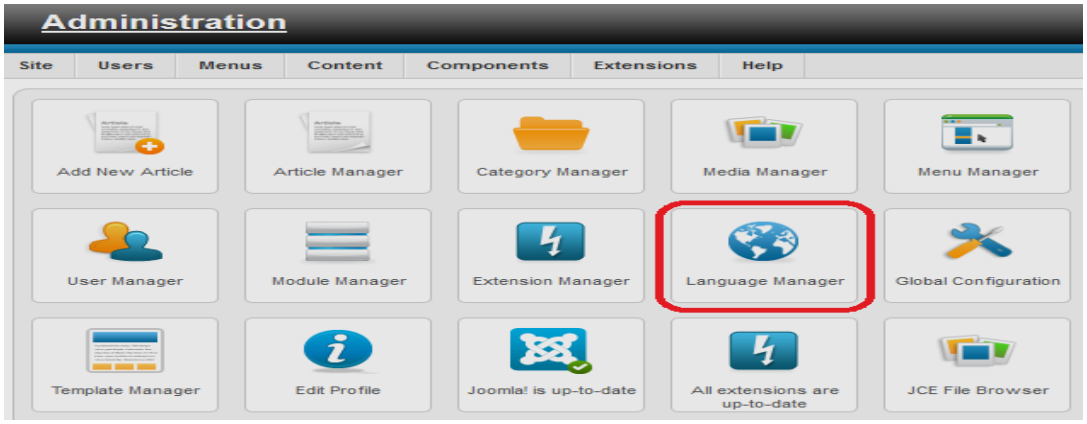

FIGURE 25. Language Manager

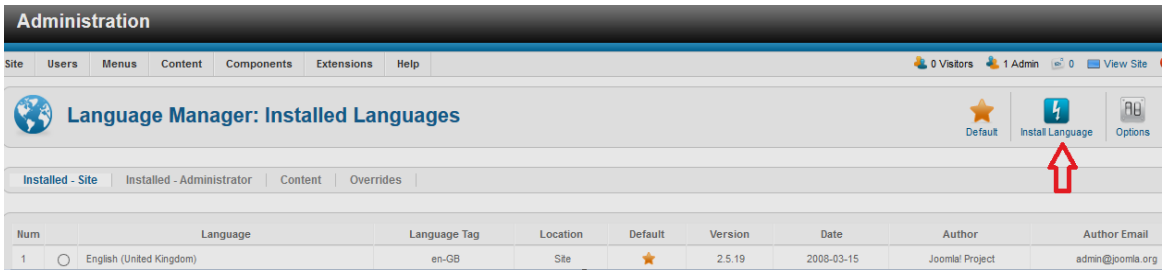

FIGURE 26. Language Installation

4 DRUPAL

Drupal is the third most used content management systems that can be used to organize, manage and publish website contents. It is an open-source software that is developed and maintained by a community of over 1,000,000 users and developers. It started as a message board in 1999 by *Dries Buytaert*. It became an open source content management system in 2001 (Drupal 2014).

Drupal management system frameworks provide only the raw materials needed for development a *Drupal* website. This implies that a good understanding of programming and a clear design vision is required in order to use this effectively (kalamityjane & margyly & RonnieRayB & ginosuave 2014).
Drupal initial release was in January 2001 and its latest (stable) release which is Drupal 7.31 was announced on the August 6, 2014 (see figure 27).

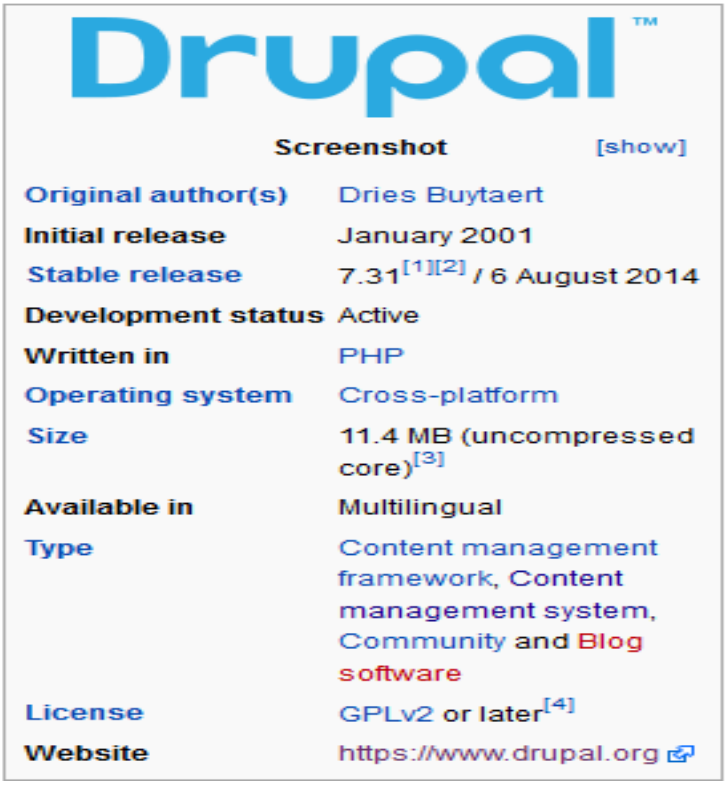

FIGURE 27. Drupal

4.1 Drupal Installation & Hosting

Drupal's installation process is almost similar to that of the installation processes of the other two content management systems (WordPress & Joomla) earlier discussed. It can be either installed automatically from the administration page of a user's hosting account or manually via a file transfer protocol (FTP). For example, it is assumed that any of the above installation process is followed and all the required login information of the user is created. So the user can install, update or manage all the necessary components of the site from the administration page when logged in (see figure 28).

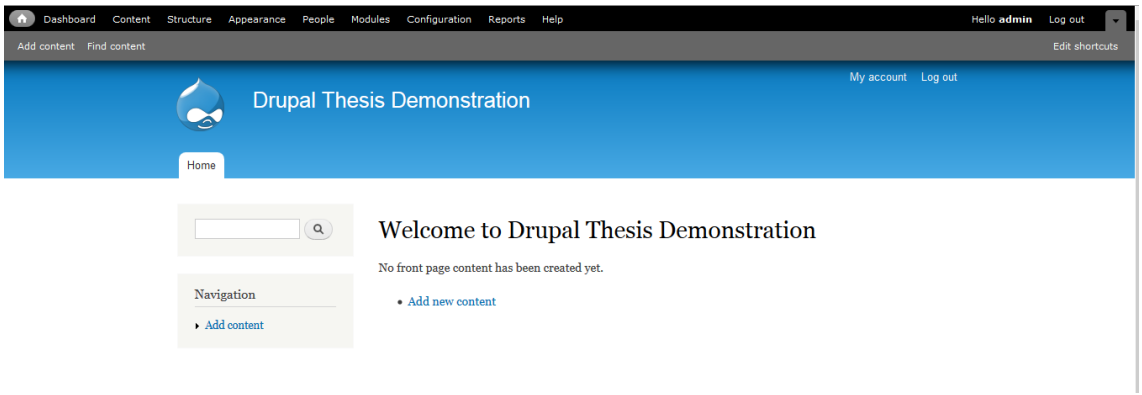

FIGURE 28. Drupal Administration Page

4.2 Drupal Core Extension

"Drupal core includes basic community features like blogging, forums, and contact forms, and can be easily extended by downloading other contributed modules and themes" (Drupal 2003). To build a Drupal site, the official Drupal core files need to be downloaded. These bundled official releases come with a various modules and themes needed to get started. Modules, themes, translations and installation profiles are used to extend the functionality of Drupal websites.

4.2.1 Modules

There are more than 25,500 free Drupal modules as of February 2014. Drupal contributed modules features such as images galleries, custom content types and content listings, WYSIWYG editors, private messaging and also third-party integration tools. Some of the most commonly used contributed modules are: Content Construction kit (CCK)-which allows site administrators to dynamically create content types by extending the database schema, Panels - a drag and drop layout manager which gives site administrators the possibility of visually designing their sites, and the Views - that facilitates the presentation and retrieval of contents to the site visitors (Drupal 2014).

For example, to manage the modules in *Drupal* website after installation, the "*Modules*" menu is selected by clicking with the mouse from the administration page (see figure 29). Then all the lists of available modules are listed from the displayed pop-up page. The various options of the displayed modules can be managed but checking or unchecking the individual modules. To install a new module, the "Install new module" on the displayed pop-up page (see figure 30).

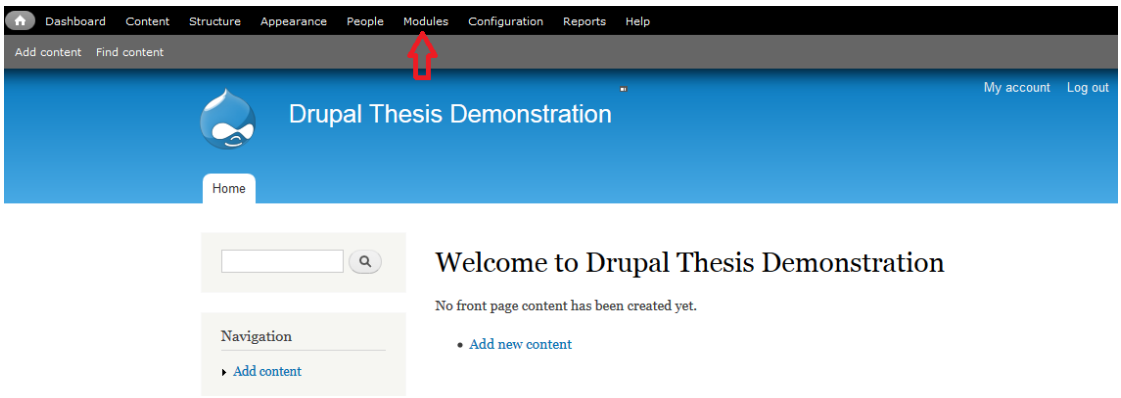

FIGURE 29. Drupal Module Management

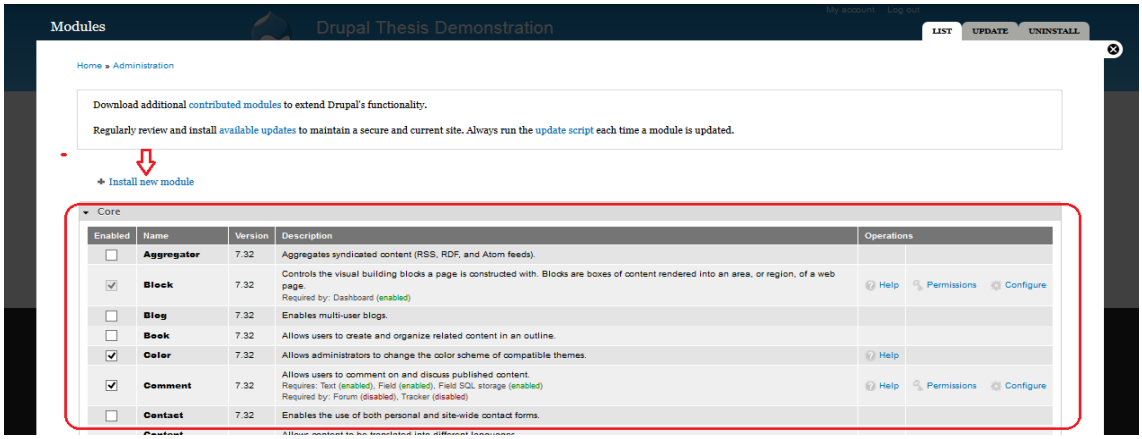

FIGURE 30. Module Installation

4.2.2 Themes

Themes can be used to change the look and feel of a Drupal website. A Drupal web developer can use themes contributed by others or create his/her own to share with the Drupal community. Contributed themes may not have the optimized functionality to meet all the development goal of a Drupal site developer but there is also a possibility for the developer to create a sub-theme which inherits the resources of an existing (parent) theme (Drupal 2014).

Not only can a Drupal theme be used to change the appearance of an entire site, it can also be used to change the appearance of only sections of a site, select types of content, or even individual pages. For example, it could be used to specify a different look for just the front page of a Drupal site, it could also be used to dynamically respond to changes in the content or to use input (Eliza411 & Iboly & LeeHunter & Davidneedham 2013).

To install a new theme to a Drupal website for example, the "Appearance" menu selected and when clicked, a pop-up page is displayed. On the displayed page, there is also an alternative option to browse through the list of available themes from Drupal's official website and to access these themes, the "*themes*" option is clicked with the mouse (see figure 31). To install a new theme, the "*Install new theme*" option is clicked and a new page with the options to either install from the local disk or from a URL is displayed (see figure 32).

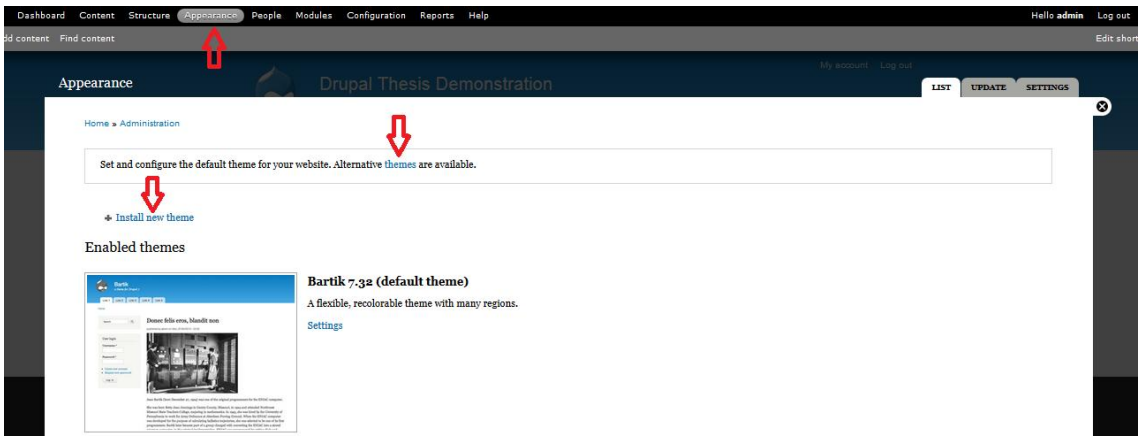

FIGURE 31. Theme Installation

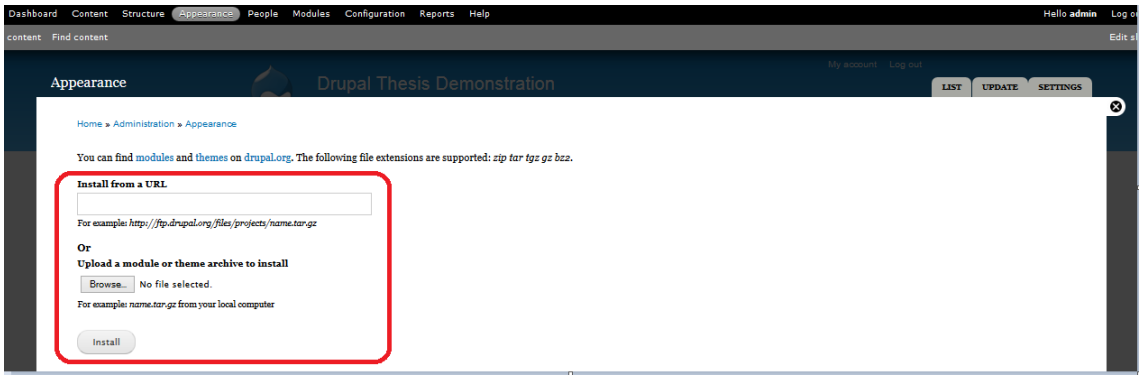

FIGURE 32. Theme External Uploads

4.2.3 Distribution

"Distributions provide site features and functions for a specific type of site as a single download containing Drupal core, contributed modules, themes, and pre-defined configuration" (Drupal 2014). They are full copies Drupal including the Drupal core, along with other software like themes, modules, installation profiles and libraries. They are made up of two main types: Full-feature distributions - which are a complete solution for specialized use cases, and other distributions - which are the starting points for developers and site builders (Liam Morland & Wusel & Killes & Neerajskydiver 2014).

4.3 Drupal Mobile Themes

There are four lists of themes that work well on mobile devices: Mobile, Fusion Mobile and Nokia Mobile (RobLoach 2008).

4.3.1 Mobile

Drupal mobile is a mobile-only HTML5 theme which was designed with a focus to have a clean, readable, usable display of content and accessibility of functions. The base theme can be used and the included child themes can also be used or make a new child theme if necessary. The purpose of this is to keep the mobile theme clean, lightweight and simple.

There are three HTML5 mobile themes: Mobile - a theme focusing on layout and templates, Mobile Light - which have some limited CSS for a very pleasing light-colored theme, and the Mobile Dark - which also have some limited CSS for a very pleasing dark-colored theme (sillygwailo 2006).

4.3.2 Fusion Mobile

"Fusion Mobile is a Fusion Core subtheme designed for creating a custom theme targeting mobile devices" (Stephthegeek 2011).This enhance the possibility of using a separate subtheme which can be used to control the theme settings and specifically block the layout/contents for mobile devices (see figure 33).

FIGURE 33. *Fusion Mobile*

4.3.3 Nokia Mobile

The Nokia mobile theme is designed to enhance mobile experience which provides different presentation layers that best serve both basic devices and the high-end smartphones. The design of this theme is based on the official Nokia templates (see figure 34).

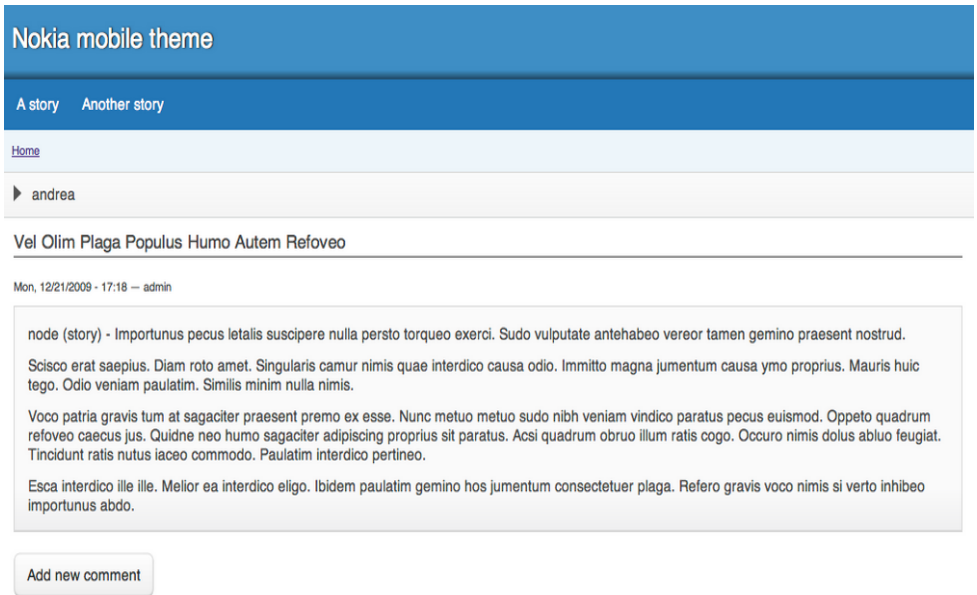

FIGURE 34. Nokia Mobile Theme

5 CMS COMPARISON

In the previous chapters, the three most used content management systems (CMS) on the internet are individually discussed. In this chapter, some comparison between the three content management systems is documented. The purpose of this is to bring out some key insight in each of the discussed content management systems(CMS) and to also help quicken the selection process of the chosen content management system to be used for any given web design project (see figure 35).

One important factor to consider when comparing and selecting any of these three systems is user support. Each of these systems has passionate, dedicated developers and user communities which make it quite easy for find free support directly through their websites or online forums or books. Of course there are also paid supports for those that may need assistance from third-party sources like consultants, developers and web designers. So the more time and effort that is invested in learning and utilizing any of the system that determines how much value that is derived from it.

CMS Comparison Table

	WORDPRESS	**JOOMLA**	**DRUPAL**
Webpage	www.wordpress.org	www.joomla.org	www.drupal.org
About	WordPress is most used content management systems (CMS) on the internet today. It is based on *PHP* and *MYSQL* technologies and licensed under the *GPLv2* (or later).	Joomla is the second most popular free and open-source content management systems (CMS) for web content publishing.	Drupal is the third most used content management systems that can be used to organize, manage and publish website contents.

Date Released	May 27, 2003	17 August 2005	January 2001
Ease of use	Technical experience not so required to use it.	Less complex than Drupal but more complex than WordPress	Requires technical knowledge to use it.
One-Click Installation	Available via web hosting companies	Available via web hosting companies	Available via web hosting companies
Manual Installation	About 5minutes	About 10 minutes	About 10 minutes
Best Use Cases	For simple web sites, such as everyday blogging and news sites and more. Supports E-commerce, social networking using some plugin functionality	Joomla allows you to build a site with more content and structure flexibility than WordPress offers, but still with fairly easy, intuitive usage. Supports E-commerce, social networking and more	For complex, advanced and versatile sites; for sites that require complex data organization; for community platform sites with multiple users;
Minimum Technical Requirements	PHP version 5.2.4 or higher MyQSL version 5.0 or higher Apache or Nginx	PHP 5.3.10 or higher MyQSL 5.1 or higher MSSQL 10.50.1600.1 or higher PostgreSQL 8.3.18 or higher Apache 2.x or higher Hiawatha 8.0 Nginx 1.0 Microsoft IIS 7	PHP 5.2.5 or higher Apache (recommended), Nginx, or Microsoft IIS MySQL 4.1 or higher, PostgreSQL 7.1 or higher,

FIGURE 35. CMS Comparison

5.1 CMS Selection

The choice of any content management system is determined by the web design project goal, technical expertise, budget and the functionality that is desired of the web design project. So there is no one specific way of choosing the right one. It is the demands of a given web design project that determines the best suitable content management to be used. Some examples may help understand this better.

For example, if a simple blog website is to be designed, *WordPress* could be the best choice because it is very friendly for both non-developers and developers who may want design very complex websites also with WordPress. For a complex, highly customized website which may require some scalability and complex content organization, *Drupal* might be the best choice. *Joomla* may be the best choice when the web design requirement is something between the simple and the complex (Rackspace Support 2013).The fact is, each situation of use of these systems may require something different and taking the time to look at the option made could be the way to go.

5.2 CMS Website Detectors

There are times modeling an already existing website on the internet becomes necessary in achieving one's web design goal. A web designer who intends to build a business website for his client may want to do some research of some similar business websites on the internet. The aim is to get some design ideas and possibly find out the platform on which those websites were built.

Attempting to manually find out the platform that a website is built can be quite challenging and time consuming. But there are many free content management system (CMS) detectors on the internet. Each of them tends to detect a website's development platforms especially if it is website built on any of the content management systems. For example, if a web designer finds a website

on the internet that he would like to model his new web design project after, he can use any of these two popular CMS detection tools below to achieve that.

5.2.1 CMS Detector

CMS Detector (www.guess.scritch.org) is designed to analyze websites and attempt to detect the platform, language, framework and other technologies used for any website. No plugins or extensions required and works with any browser (Guess 2014).

For example, to try to find out the content management that *Goshen Solutions* (www.goshensolution.com) is built on, the CMS Detector home page is visited (see figure 36). The page provides a URL search option to insect the website URL to detect and then the "Detect" button is clicked to scan through the website. Using Goshen Solutions as earlier stated, the detection result is shown (see figure 37).

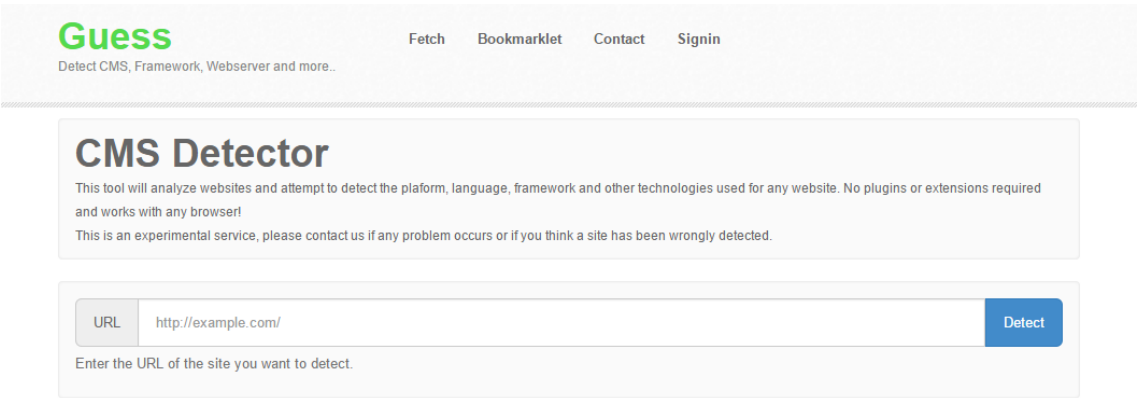

FIGURE 36. Guess CMS Detector Page

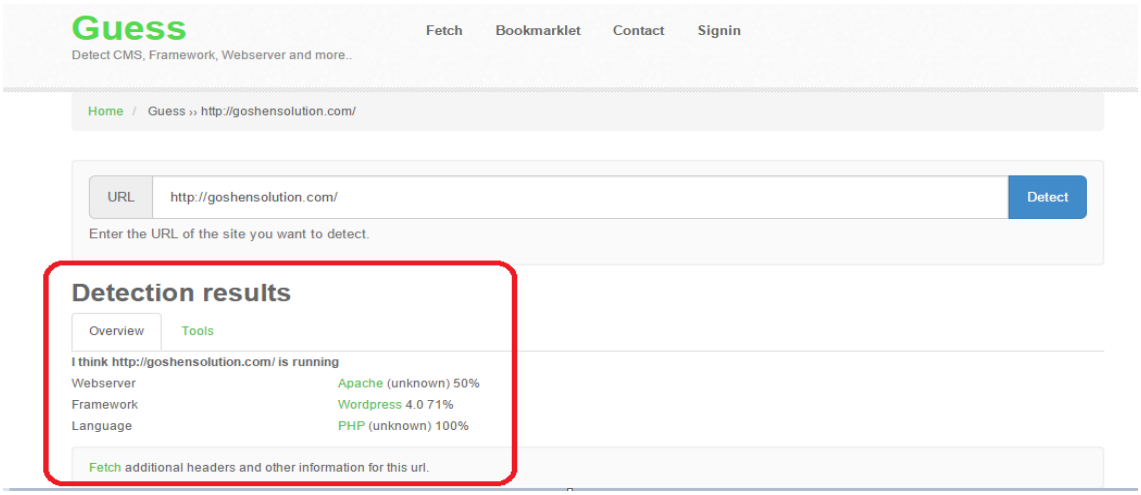

FIGURE 37. Detected Results

From the detection result of the above example, *Goshen Solution* is built on WordPress. Other information like the web server and the programming language of the frame used can also be detected if available.

5.2.2 BuiltWith

BuiltWith (www.builtwith.com) does almost the same as the CMS Detector but it goes a little deeper in giving more in-depth details of a website including the CMS platform, Server information, Framework, Advertising used, Widgets used, Content Delivery Network, Document information and other vital information about the website. *BuiltWith* is similar to that of the CMS Detector earlier demonstrated (see figure 38).

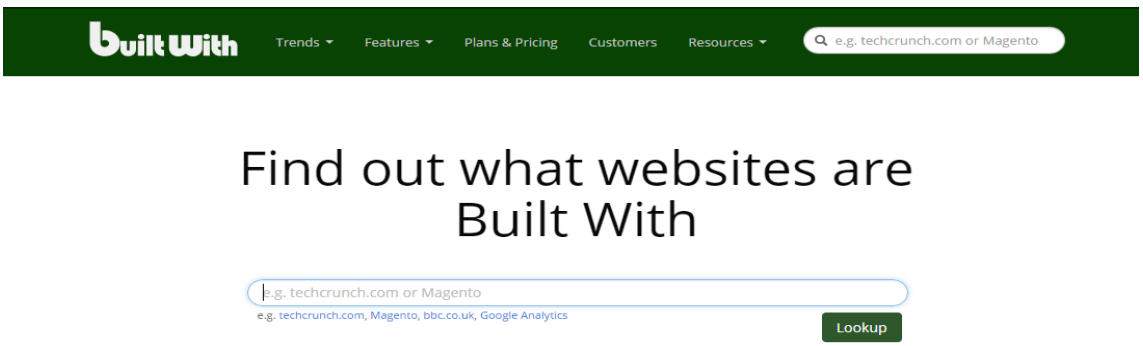

FIGURE 38. BuiltWith Home Page

6 CONCLUSION

Years ago, designing a business website required so much budgeting, hand-coding and time. Content management systems have played a tremendous role in the regard. With these systems like the ones discussed in this report, a website can be built literally within days or weeks depending on the project goal. Having discussed the three most common content management systems (CMS) the behind most websites on the internet, it is equally important also to reflect on the best choice for a project goal.

When choosing a content management system for a project goal, it may not be too necessary to base it on the popularity of the system. Rather, it should be based on demands of the project. That is, the requirements of the project. Having considered the project requirements, a user's technical competence of the project is also considered. It is after these two factors are considered that the choice of a suitable content management system may be decided. The important step of applying the methods discussed in the report is to understand that the order to which the content management systems (from most popular to the least) are not fixed or rigid. It is a particular goal that determines the choice of the content management system that is used.

Another method of getting an idea of the most suitable content management system to use for a particular project is to do a quick research on the internet. The purpose of this research is to search for some already existing websites in the same niche or category. For example, if a business website is to be designed, then searching for some already existing business websites may be a good idea. This may be helpful in getting some web design idea before the actual implementation of the project. Then any of the website analyzing tools (*CMS Detector* and *BuiltWith*) discussed can be used to uncover the content management system used for those researched websites.

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CONTENT MANAGEMENT SYSTEMS APPENDIX 1

Content Management System
http://en.wikipedia.org/wiki/Content_management_system

Compare Content Management Systems
http://www.cmsmatrix.org

Content Management System Software Review
http://cms-software-review.toptenreviews.com

Free Content Management System (CMS) Comparison table
http://socialcompare.com/en/comparison/popular-content-management-system-cms-comparison-table

Joomla Reviews
http://cms-software-review.toptenreviews.com/joomla-review.html

WordPress Reviews
http://cms-software-review.toptenreviews.com/wordpress-review.html

10 Things To Consider When Choosing The Perfect CMS
http://www.smashingmagazine.com/2009/03/05/10-things-to-consider-when-choosing-the-perfect-cms

Top 12 Free Content Management Systems (CMS)
http://spyrestudios.com/free-content-management-systems

suPHP
http://www.suphp.org/Home.html

OTHER COMMONLY USED CMS

APPENDIX 2

Concrete5

http://www.concrete5.org

Cushy CMS

https://www.cushycms.com/en

dotCMS

http://dotcms.com

eZ Publish Platform

http://ez.no/Products/Content-Management

Frog CMS

http://www.madebyfrog.com

ExpressionEngine

https://ellislab.com/expressionengine

MODX

http://modx.com

ocPortal

http://ocportal.com/start.htm

Radiant CMS

http://radiantcms.org

Rubedo

http://www.rubedo-project.org

SilverStripe CMS

http://www.silverstripe.org

TYPOlight CMS

https://contao.org/en

WebGUI

http://www.webgui.org